



Transportation Outsourcing and Supply Chain Performance: A study of Pakistan's Pharmaceutical Industry

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ABSTRACT

Recent times have witnessed that transportation outsourcing of logistics functions is a key business strategy to augment the feat of supply chain performance. Heap of empirical literature showed significant impact of transportation outsourcing on effectiveness and efficiency of supply chain management of firms. This paper investigated the impact of transportation outsourcing on supply chain performance for the 30 pharmaceuticals companies operating in Pakistan. Results confirmed that transportation outsourcing by outlined industry do not only improve SCM performance but also provide a significant influence on supply chain effectiveness and efficiency for the Pharmaceutical sector of Pakistan.

Keywords: SCM, Efficiency, Outsourcing, Effectiveness.

JEL Classification: L9, R41

Introduction

The dynamic part of any business is considered its logistics. An effective supply chain strategy must need to address the logistical drivers especially transportation very effectively. Though it is considered an ancillary activity however an efficient transportation management can be a source of competitive advantage for a business. Owing to the importance of transportation, businesses have incorporated various strategies to manage it effectively (Mitra, 2006). One of the prominent strategies used to make transportation effective and efficient is considered outsourcing.

However, at empirical level there are studies required especially in pharmaceutical sector of Pakistan, which will be able to encapsulate the relationship of transportation outsourcing with effectiveness and efficiency of a business. The objective of this research is to empirically examine the relationship of outsourcing with a firm's supply chain effectiveness and efficiency in pharmaceutical sector of Pakistan. Due to influx of competition and price regulations, companies in pharmaceutical sector of Pakistan put more emphasis on cost reduction though the companies are opting outsourcing as a viable option

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for improving their SCM performance; still there remains suspicion to take decision. The next section of the paper briefly discusses the reasons for the lack of clear empirical evidences related to outsourcing SCM association in the light of empirical literature.

Literature Review

Generally subcontracting any business activity, which was previously being performed in-house is considered as outsourcing. The rise in the market competition compelled companies to reduce their cost, outsourcing became as a viable option (Peter, Embleton, Phillip, & Wright, 1998). Since, then for competing effectively in market, companies use outsourcing as one of their main business strategies. The vital business activity, which is being outsourced for the sake of firm's performance improvement, is transportation outsourcing (De Kluyver & Pearce, 2006). Various terminologies are used to depict logistic outsourcing e.g. distribution contract, logistics alliance, operational alliance, contract logistics and third party logistics (3PL) (Lieb & Randall, 1996; Laarhoven & Graham, 1994). Empirically, companies in manufacturing sector are outsourcing their transportation at a very fast pace. The underlying objective behind this is cost advantage with improved service quality. This has also led companies to have a sustainable long term relationship with their outsourced partners (Cooper, 1993; Dapiran, Lieb, Millen, & Sohal, 1996; Cooper, Lambert, & Pagh, 1997).

Companies who have outsourced their transportation has not only successfully reduced their overall cost but also has made their supply chain more agile due to two principle reasons; First, outsourcing results in decrease of capital investment that further decreases the depreciation and operational cost. Secondly, since the outsourced partner has specialized in the activity being outsourced to him, it increases the effectiveness of the service (Lambert, Cooper, & Pagh, 1998). The argument of Lambert, Cooper, and Pagh (1998) has been empirically analyzed by (Sohal, Millen, & Moss, 2002). They conducted a study on Australian manufacturing firms to find out the influence of outsourcing on cost and agility of their supply chain. Study has found that transportation outsourcing has significant positive relationship with overall cost of the company and supply chain agility. Similar results have also been illustrated by (Gammelgaard & Larson, 2001; Vokurka & Lummus, 2000). Understanding importance of logistics in supply chain, Stank, Davis, and Fugate (2005) mentioned that success of a company depends upon its supply chain whereas, success of supply chain depends upon the performance of logistics especially transportation. Stank, Davis, and Fugate (2005) argued that the workable option to improve the transportation performance of a company is to outsource it to a service provider who is specialist in that specific field. It will not only result in augmenting the agility of the transportation but will also lower the transportation cost of a business. Summing up, the study concluded that transportation outsourcing is one of the key elements of any business in manufacturing sector.

Similarly, Rodrigues, Bowersox, and Calantone (2005) assert that for sustainable competitive advantage, companies have to rely on their supply chain, which further banks upon the degree of activities outsourced. Strategically, outsourcing the subsidiary business performance directly influences the performance of supply chain of any company. In this context, the activity, which companies can outsource at very outset, is transportation. If the company is unable to maintain its relationship with external stakeholders then outsourcing can result in decreasing performance of the company (Lai & Cheng, 2003).

Srivastava (2006) studied the Indian manufacturing companies for analyzing the effects of outsourcing. In the first analysis, the study showed mix results where outsourcing was only affecting the cost of business negatively and this relationship was also not very strong. In the second analysis, the study bi-furcated the companies into groups i.e. Group A: companies who have ability to maintain their relationship with outsourced partners and Group B: companies which have weak relationship management with their outsourced

partners. It for revealed that in former case outsourcing had significant negative impact on cost and significant positive impact on quality of service of the companies. In latter case, the outsourcing only affected the cost. The results portrayed a very important element for outsourcing that is appropriate relationship with outsourced partners. Likewise, a similar type of study has been conducted in China and it was concluded that outsourcing not only reduces cost of business but also increases customer satisfaction.

A constant rise in third party logistic providers (3PL) is also considered an evidence of increasing trend of outsourcing. Which is further connected to the positive impacts of outsourcing on performance of a company. Wilding and Juriado (2004) explained the reason of rise in outsourcing in UK's FMCG industry; Study mentioned that logistics outsourcing has drastically decreased the logistics cost of companies. The study of Murphy, Cifuentes, Yakimovicz, Segur, Mahoney, & Kodali (1996), have also come across such findings in the past. The study asserted that most of multinational companies are outsourcing their transportation. Explaining this argument it has mentioned that the reason of that steep trend of transportation outsourcing was due to its substantial impacts on performance of a company.

Bundle of studies have showed a significant impact of outsourcing on supply chain performance (Bhatnagar, Sohal, & Millen, 1999; Knemeyer, Corsi, & Murphy, 2003; Langley, Allen, & Colombo, 2003; Sohail, Austin, & Rushdi, 2004). Supply chain performance has been evaluated from two facets i.e. cost and quality. Cost has been operational by using the transportation cost of the companies. Some of the scholars i.e. Dapiran, Lieb, Millen, and Sohal (1996); Cooper, Lambert, and Pagh (1997) considered reducing lead-times and back-orders as sign of quality whereas, increasing customer satisfaction as the sign of improving quality.

The case of Latin American countries by Lieb and Randall (1996) depict that majority of manufacturing firms in Latin America are outsourcing their transportation however, all of the companies are not successful in improving their performance. The reasons were found with the help of working on case studies of some of the selected firms, Lieb and Randall (1996) found that the companies having ability to maintain relationship with external stakeholders, and having high level of commitment were more likely to get the benefit of outsourcing. Sahay and Mohan (2003) have portrayed similar findings in a study of Indian firms. It was found that companies with high level of commitment, better relationship management ability and high experience of outsourcing have significant impact of outsourcing on their SCM performance.

From the review of empirical literature it can be inferred that outsourcing has a significant influence on a firm's SCM performance however, the degree of this effect is subject to number of factors. Main factors like relationship quality, level of commitment, length of outsourcing relationship and experience of outsourcing are the prominent moderators.

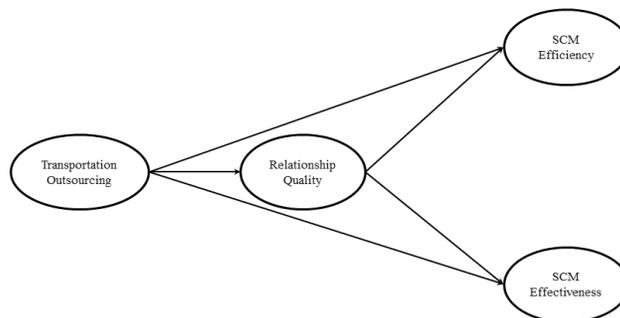


Figure 1: Conceptual Frame Work

Data and Methodology

The data for the study has been collected through primary source. The population of the study is the total number of pharmaceutical industries in Pakistan. According to the data of Pakistan Pharmaceutical Manufacture Association (PPMA) approximately 400 manufacturing units are operating in Pakistan with 350 national and 50 multinational companies. Due to time and finance constraint, convenient sampling has been used in this research. A close ended questionnaire was sent to 120 SCM professionals from selected 30 pharmaceutical companies in Karachi.

The Partial Least Square (PLS) method was used for estimation purposes. The advantage of this technique is its application on small sample size. The PLS is popular due to its capacity to model latent construct in conditions of non-normality and capacity to examine partial links without requiring a complete structured model (Chin, 1998). It also simultaneously examines the model and appraises the properties of underlying the model.

Survey Findings

The survey findings from 102 SCM professionals from 30 companies responded by filling complete questionnaire. However 38 questionnaires were not properly filled, which were eliminated. Hence a total of 62 questionnaires were processed for data analysis.

Table 1: Profile of Firms

	Number
(1) Number of Employees	
≤ 150 employees	12
151 – 350 employees	30
351 - 550 employees	18
> 551 employees	6
(2) Years in Operation	
< 1 year	8
1 - 5 years	32
6 - 10 years	11
> 10 years	9

After profiling the reliability and validity has been constructed by assessing factor loading, Cronbach alpha, composite reliability (CR) and average variance extracted (AVE). For item reliability, factor loadings should be more than 0.5, while for the convergent validity value of AVE and CR should be greater than 0.5 and 0.6 respectively (Saade 2007). Table 2 illustrates the results of factor loading, AVE, CR and Cronbasch alpha. Factor loading for all the items in constructs range are from 0.66 to 0.88, which is well above the minimum limit. Likewise the values of AVE, CR and Cronbach alpha are well above the minimum values, characterizing that instrument has both convergent and discriminant reliability

Table 2: Reliability and Validity of Instrument

Construct	Factor Loading	AVE	Composite Reliability	Cronbach Alpha
Outsourcing		0.652	0.882	0.812
O1	0.72			
O2	0.78			
O3	0.84			
O4	0.88			
Efficiency		0.584	0.848	0.712
E1	0.74			
E2	0.82			
E3	0.79			
E4	0.70			
Effectiveness		0.598	0.899	0.799
EF1	0.73			
EF2	0.77			
EF3	0.84			
EF4	0.89			
EF5	0.67			
EF6	0.72			

After ascertaining the reliability and validity of survey instruments we applied PLS by using Smart PLS software. Table 3 reports the results of the hypotheses testing.

Table 3: Results of PLS Analysis

Hypothesis	Path Coefficients (β)	Results
H1: Outsourcing \rightarrow Efficiency	0.198*	Supported
H2: Outsourcing \rightarrow Effectiveness	0.081*	Supported
H3: Outsourcing \rightarrow Relationship quality \rightarrow Efficiency	0.006**	Supported
H4: Outsourcing \rightarrow Relationship quality \rightarrow Effectiveness	0.07*	Supported

* and ** show significance at 1% and 5% level respectively

The research has primarily tested four hypotheses. First hypothesis test *the influence of transportation outsourcing on SCM efficiency*. The significant coefficient value depicts a positive significant effect of outsourcing on SCM efficiency. Likewise, second hypothesis examine *the impact of transportation outsourcing on SCM effectiveness*. The coefficient values are significant at 1%, illustrating a momentous positive influence of outsourcing on SCM effectiveness in case of Pharmaceuticals of Pakistan. The third Hypothesis examines *the mediating role of relationship quality between outsourcing and efficiency*. The coefficient values are significant at 5% but not so high. It depicts that relationship quality partially mediates the relationship between outsourcing and SCM efficiency. Similarly, the fourth hypothesis tests *the mediating role of relationship quality between outsourcing and SCM effectiveness*. The coefficients value is significant and high showing partial mediator role of relationship quality between outsourcing and SCM effectiveness. Borgström (2005) investigated and clearly established the different roles of efficiency and effectiveness in the supply chain was remarkable. It was evident through many researchers that efficiency gives

cost related advantages while effectiveness gives advantages in customer orientation, thus, the value can be created through efficiency and effectiveness (Möller & Törrönen, 2003).

Conclusion & Recommendations

The results depict that in Pakistan most of the pharmaceutical companies are using the outbound logistics as a outsource activity in business. The companies' major motive behind outsourcing is cost reduction. The results of the correlation depict that there is a significant influence of transportation outsourcing, especially outbound transportation outsourcing and on the SCM performance of companies. The primary reason for transport outsourcing is lack of investments and companies are more conscious about the cost and are not interested to invest in non core activities. By transport outsourcing, companies are required to invest less and their main focus is on the core activities.

Cost is a prominent factor that has a significant impact on the companies to outsource their logistics activities. In cost, the operating expense enforces the companies to outsource their logistics activities. Many respondents consider that the lead-time is the reason of the transport outsourcing but overall results showed that it may have a slight impact. Respondents and representatives of the pharmaceutical companies indicated that the main benefit of the transport outsourcing is the focus on the core competency as described earlier. Cost reduction is also another benefit of transport outsourcing. The supply chain representatives consider that the transport outsourcing is a strategy to reduce their cost. Majority of the respondents believed that the transport outsourcing is increasing the level of customer satisfaction. On-time delivery and loss & damage performance by the transport provider is the main reason for dissatisfaction of the companies. In spite of the loss and damage, companies are more conscious about on-time delivery. Maximum responding companies are satisfied with performance of their transport provider. At the end, the results show that transport outsourcing is increasing the customer satisfaction level and companies are satisfied with the performance of transport provider.

In the light of the above fact, the transport outsourcing is beneficial for the pharmaceutical companies and gives a positive impact on the supply effectiveness and efficiency. At the end, the results concluded that due to several reasons such as uncertainty of economical situation and fluctuation in oil prices and poor road infrastructure, companies are outsourcing their transport activities in Pakistan.

By outsourcing transportation, companies not only can focus on their core competencies but can also improve the performance of their supply chain management system. Cost can be minimized and lead-time can be reduced by the transport outsourcing, resulting on the supply chain effectiveness and efficiency.

References

- Bhatnagar, R., Sohal, A.S., & Millen, R. (1999). Third party logistics services: a Singapore perspective. *International Journal of Physical Distribution & Logistics Management*, 29 (9), 569-87.
- Borgström, B. (2005). Exploring efficiency and effectiveness in the supply chain: A conceptual analysis. *21st Industrial Marketing and Purchasing-Conference*, Rotterdam, Netherlands. Retrieved from: <http://www.impgroup.org/uploads/papers/4670.pdf>
- Cooper, J.C. (1993). Logistics Strategies for Global Businesses. *International Journal of Physical Distribution and Logistics Management*, 23 (4), 12-23.
- Cooper, M.C., Lambert, D.M., & Pagh, J.D. (1997). Supply chain management: more than a name for logistics. *The International Journal of Logistics Management*, 8 (1), 1-14.
- Dapiran, P., Lieb, R., Millen, R., & Sohal, A. (1996). Third Party Logistics Services Usage

- by Large Australian Firms. *International Journal of Physical Distribution and Logistics Management*, 26 (10), 36-45.
- De Kluyver & Pearce, (2006) *Strategy a View from the Top*. Evidence from a sub-Sahara African nation. *International Journal of Logistics: Research and Applications*, 7 (1), 45-57.
- Gammelgaard, B. & Larson, P.D. (2001). Logistics skills and competencies for supply chain management. *Journal of Business Logistics*, 22 (2), 27-50.
- Knemeyer, M., Corsi, T., & Murphy, P. (2003). Logistics outsourcing relationships: customer perspectives. *Journal of Business Logistics*, 24 (1), 77-109.
- Laarhoven, P.V. & Graham, S., (1994). Logistics alliances: the European experience. *The McKinsey Quarterly*, 1, 39-49.
- Lai, K. & Cheng, T.C.E. (2003). Supply chain performance in transport logistics: an assessment by service providers. *International Journal of Logistics: Research and Applications*, 6 (3), 152-64.
- Lambert, D.M., Cooper, M.C. & Pagh, J.D. (1998). Supply chain management: implementation issues and research opportunities. *The International Journal of Logistics Management*, 9 (2), 1-19.
- Langley, C.J., Allen, G.R. & Colombo, M.J. (2003). Third Party Logistics Study: Results and Findings of the 2003 Eighth Annual Survey. Retrieved from <http://www.scl.gatech.edu/downloads/3PL/20033PLReport.pdf>
- Lieb, R. & Randall, H. (1996). A comparison of the use of third party logistics services by large American manufacturers, 1991, 1994, and 1996. *Journal of Business Logistics*, 17 (1), 305-320.
- Mitra, S. (2006). A survey of Indian third-party logistics service providers. *IIMB Management Review*, 18 (2), 159-174.
- Möller, K. E. K. & Törrönen, P. (2003). Business suppliers' value creation potential: A capability-based analysis. *Industrial Marketing Management*, 32 (2), 109-18.
- Murphy, K., Cifuentes, L., Yakimovicz, A., Segur, R., Mahoney, S., & Kodali, S. (1996). Students Assume the Mantle of Moderating Computer Conferences: A Case Study. *American Journal of Distance Education*, 10 (3), 20-35.
- Peter, R., Embleton, Phillip C., & Wright (1998). A practical guide to successful outsourcing. *Empowerment in Organizations*, 6 (3), 94 – 106.
- Rodrigues, A.M., Bowersox, D.J. & Calantone, R.J. (2005). Estimation of global and national logistics expenditures: 2002 data update. *Journal of Business Logistics*, 26 (2), 1-15.
- Sahay, B.S. & Mohan, R. (2003). Supply chain management practices in Indian industry. *International Journal of Physical Distribution & Logistics Management*, 33 (7), 582-606.
- Sohail, M.S., Austin, N.K. & Rushdi, M. (2004). The use of third-party logistics services: Evidence from a sub-Sahara African nation. *International Journal of Logistics: Research and Applications*, 7 (1), 45-57
- Sohal, A., Millen, R. & Moss, S. (2002). A comparison of the use of third-party logistics services by Australian firms between 1995 and 1999. *International Journal of Physical Distribution & Logistics Management*, 32 (1), 59-68.
- Srivastava, S.K. (2006). Logistics and supply chain practices in India. *VISION – The Journal of Business Perspective*, 10 (3), 69-79.
- Stank, T.P., Davis, B.R. & Fugate, B.S. (2005). A strategic framework for supply chain oriented logistics. *Journal of Business Logistics*, 26 (2), 27-45.
- Vokurka, R.J. & Lummus, R.R. (2000). The role of just-in-time in supply chain management. *The International Journal of Logistics Management*, 11 (1), 89-98.
- Wilding, R. & Juriado, R. (2004). Customer perceptions on logistics outsourcing in the European consumer goods industry. *International Journal of Physical Distribution & Logistics Management*, 34 (8), 628-44.